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THE SABRE-TOOTHED CAT *MEGANTEREON* FROM THE PLEISTOCENE OF JAVA

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(with plate IV, and one text-figure)

In April 1961 the present author made a study of the fossil Carnivora from Java in the Dubois Collection, of the Rijksmuseum van Natuurlijke Historie, Leiden. Among a lot of unidentified specimens, one was found to represent a sabre-toothed cat of a type not hitherto known from the Pleistocene of Java.

The only sabre-tooth so far known from the Pleistocene of Java is *Homotherium zwierzyckii* (Koenigswald), which occurs in the Djetis fauna. The new form is certainly not a *Homotherium*, and may be identified as a member of the genus *Megantereon*. Thus it can be shown that both of the characteristic Pleistocene Old World forms of machairodont cats were represented in Java. Though the genus *Megantereon* does not survive in post-Villafranchian times in Europe, as far as our present information goes, it certainly does so in China as well as in Africa. It is known from the middle Pleistocene faunas of Choukoutien as well as from the Transvaal australopithecine caves (Teilhard, 1939; Ewer, 1955). Indeed, the situation at Choukoutien, Locality 1, where the two forms *Homotherium ultimum* (Teilhard) and *Megantereon inexpectatus* (Teilhard) are associated, is quite analogous to that in Java.

DESCRIPTION OF THE SPECIMEN

The specimen, Coll. Dubois No. 1464, is a fragment of an upper canine, apparently of the right side. It bears only the inscription E. 13, but since that alludes merely to the packing-case, it does not establish the exact provenience of the tooth. Dr. D. A. Hooijer drew my attention to the relatively

eroded and pitted surface of the find, which is similar to that exhibited by the first *Pithecanthropus* skull from Trinil. This condition is seen in several, though by no means all, specimens from that locality. Of course, indications of this kind must be treated with the greatest caution. It is clear, however, that the middle Pleistocene of either the Trinil or the Djetis zones must remain the most probable source of this fossil.

The crown of the canine has been almost entirely lost, the break being ancient. Only the root, which is complete, and a few millimeters of the proximal part of the crown remain. The pulp cavity is still fairly large, though the apex of the root is closed, showing that the animal was an adult.

The anterior edge of the tooth crown is blunt, as in *Megantereon,* and lacks the keeled edge so characteristic of the *Homotherium* group. In the latter, this edge carries well up to the enamel basis, and would doubtless have been visible if present. The posterior edge is similarly blunt, whereas in the homotheres it is extremely sharp and finely crenulated. Even though the erosion of the tooth might have abraded the crenulation, it could not have produced the smooth rounding of this specimen, typical of the proximal part of the canine crown in *Megantereon.* In the closely related *Smilodon,* where the keeling of the canines is more developed than in *Megantereon,* the basis of the posterior edge is also blunt.

The cross section of the tooth, at the crown base, is a flattened ovoid of the same proportions as that in the sabres of *Megantereon* and *Smilodon,* and quite unlike the thin, sharp-edged section of the homotheriine tusk. The data assembled in table I exemplify the difference.

TABLE I

Dimensions of sabre-tooth canine teeth (mm)

	Coll. Dub. No. 1464 *Megantereon* sp. Java	Brit. Mus. No. 15433 *M. megantereon* Val d'Arno	Brit. Mus. No. 17926 *H. latidens* Bacton
Length of root (posterior edge)	70-75	72½	55½
Transverse diameter at crown basis	11.5	12.5	11.4
Anteroposterior diameter at crown basis	23.0	24.7	31.4
Transverse in per cent of anteroposterior diameter	50	51	36

Figure 1 shows comparative views of the Javan specimen and European specimens of *Megantereon* and *Homotherium.* It may be noted that the root

of the homotheriine canine tapers evenly from the crown basis towards the apex, whereas the anteroposterior diameter remains constant in *Megantereon* up to about half-way from the crown basis to the apex.

Apart from these characters, the only morphological peculiarities to be noted on the Javan specimen are the course of the enamel basis, which is shown in Pl. IV and the presence of two shallow longitudinal grooves along the root, present on both the internal and the external side.

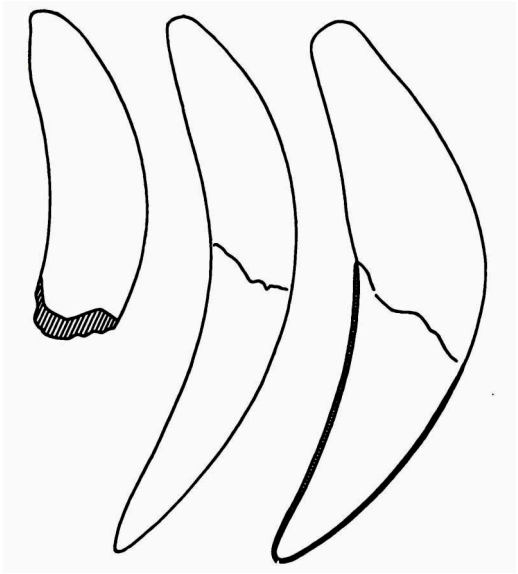

Fig. 1. Outline drawings of machairodont canines. Left, *Megantereon* sp., Pleistocene, Java; centre, *Megantereon megantereon*, Val d'Arno (redrawn from Boule); right, *Homotherium* (or *Dinobastis*?) *crenatidens*, Val d'Arno (redrawn from Boule). All one-half natural size.

DISCUSSION

The establishing of megantereont affinities of the new specimen is of interest, because there can be no doubt of the homotheriine affinities of the form described from the Djetis by von Koenigswald (1934). This is based on a fragment of the lower jaw, containing the damaged incisors, the canine, and the fourth premolar. The large but very thin P_4, the serrated edges of the canine, and the shape of the jaw demonstrate that this specimen is a member of the group variously known under the names *Homotherium*, *Dinobastis*, and *Epimachairodus*. The last-mentioned name is a junior synonym and may be disregarded. Whether it is in fact a *Homotherium* or a *Dinobastis*, and whether indeed these genera are separate, must await a revision of the European and American type material. However this may be,

the homotheriine group exhibits an adaptive type completely different from that of the *Megantereon-Smilodon* group. In the homotheres, the canines and cheek teeth are very thin and sharp blades, and the canines still bit functionally against each other to some extent, suggesting that these animals were not exclusive "stabbers" but incapacitated their prey by biting and slashing. In *Megantereon* and *Smilodon* the sabres are much longer and more dirk-like, highly adapted for stabbing, whereas the cheek dentition is less modified. With these distinctions there go profound differences in the skull shape: the long, arched homotheriine skull with its low occiput is a marked contrast to the triangular profile of the *Megantereon* or *Smilodon* skull. The differences may indicate that the two types of sabre-toothed cats were not ecologically incompatible.

In concluding I wish to express my sincere gratitude to Dr. D. A. Hooijer for generous hospitality and help.

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Coll. Dubois No. 1464, *Megantereon sp., Pleistocene,* Java, root of upper canine tooth, side view and section. Natural size.